Confidential and Commercially Sensitive:

Contains information that would unreasonably prejudice the commercial position of Winstone Aggregates if released



Hunua Quarry Development: Supporting Auckland growth and securing its Aggregate Supply

3 May 2024

s 9(2)(a)



Document Control				
Project Name	Hunua Quarry Development			
Date	3/05/2024			
Version	Rev 1			
Issue Status	Final			
Author	s 9(2)(a)			
Engineering input				
Economic input				
Reviewers				
Approval				
Confidential and	Confidential and Commercially Sensitive – contains			
Commercially	information that would unreasonably prejudice the			
Sensitive	commercial position of Winstone Aggregates if released			



Table of contents

CUTIVE SUMMARY:	4
INTRODUCTION:	7
BACKGROUND	8
ECONOMIC CONTRIBUTIONS OF HUNUA QUARRY	.12
PROJECT SCOPE AND DESCRIPTION:	.15
LEGISLATIVE FRAMEWORK AND APPROVAL REQUIREM	IENTS
POTENTIAL ENVIRONMENTAL EFFECTS	.27
TE TIRITI O WAITANGI (TREATY OF WAITANGI) SETTLEN ANGEMENTS AND COMMITMENTS THAT IMPACT THE	MENTS,
POSAL	.31
PROJECT DETAILS AND OPTIMAL DEVELOPMENT:	.33
ALTERNATIVES AND OPTIONS	.34
TIMEFRAME AND EFFICIENCY GAINS:	.34
CONCLUSION:	.35
ENDIX A: RECORD OF TITLES	.37
ENDIX B: ECONOMIC REPORT	. 38
ENDIX C: ENVIRONMENTAL CREDENTIALS	. 39
ENDIX D: ENGINEERING DRAWINGS	.43
NITIONS	.44
	UTIVE SUMMARY: INTRODUCTION: BACKGROUND ECONOMIC CONTRIBUTIONS OF HUNUA QUARRY PROJECT SCOPE AND DESCRIPTION: LEGISLATIVE FRAMEWORK AND APPROVAL REQUIREM 26 POTENTIAL ENVIRONMENTAL EFFECTS. TE TIRITI O WAITANGI (TREATY OF WAITANGI) SETTLEM ANGEMENTS AND COMMITMENTS THAT IMPACT THE POSAL. PROJECT DETAILS AND OPTIMAL DEVELOPMENT: ALTERNATIVES AND OPTIONS TIMEFRAME AND EFFICIENCY GAINS: CONCLUSION: ENDIX A: RECORD OF TITLES ENDIX A: RECORD OF TITLES ENDIX B: ECONOMIC REPORT ENDIX C: ENVIRONMENTAL CREDENTIALS ENDIX D: ENGINEERING DRAWINGS NITIONS



Executive Summary:

Winstone Aggregates (Winstones) the owner and operator of Hunua Quarry in Auckland, puts forward its Hunua Quarry Development proposal for consideration as a project to be referred via the Governments new Fast Track Approvals Bill. The Hunua Quarry Development Proposal strategically aligns with the New Zealand Government's initiative to streamline regional, and nationally significant development through the fast-track consenting process. This proposal aims to significantly enhance Hunua Quarry's capacity to continue to supply premium aggregate, extending the life of the quarry and providing quality aggregates that are vital for the wider Auckland region's infrastructure, underlining its regional and national significance.

Key Points:

The problem: Auckland's increasing demand for aggregate is creating potential supply and capacity issues at Hunua Quarry. In 2022, Auckland imported 4.5 million tonnes of aggregate, and this figure is expected to rise over the next 20 to 30 years due to the lack of new quarries in the region. With an influx of infrastructure projects, including some via Fast Track, Hunua is poised to reach s 9(2)(b)(ii)

to justify the investment. Securing additional supply approvals through existing pathways would take over 5 years, delaying the ability to meet anticipated demand. <u>Without accelerated long-term solutions, Hunua Quarry may not meet</u> the region's needs, risking a supply crisis for Auckland.

- Solution: Accelerating securing the necessary approvals for access to additional resource, within the current quarry ownership boundaries, is urgently needed to unlock existing rock/aggregate resource. Using the existing consenting framework would take 5+ years, with larger risk and likely that less resource is approved via resource consent process. The proposed new aggregate resource occurs within the Winstone Aggregates owned land, it minimises the external growth and <u>will extend the life of the quarry for ^{S 9(2)(b)(ii)}</u> This additional resource will give the business confidence to invest and increase capacity.
- Certainty of life for Investment. If the^{S 9(2)(b)(ii)} esource is approved under this process, then the business will have certainty to invest significant financial

Confidential and Commercially Sensitive:



expenditure. This has been estimated at $e^{s g(2)(b)(ii)}$ for the life of the quarry. This financial expenditure would be invested in new equipment and plant that would increase the capacity of the site.

- Strategic growth via Fast-Track: Prioritising the quarry's growth through the fasttrack process underscores the urgent need to secure a sustainable aggregate supply for Auckland, directly contributing to key regionally and nationally significant infrastructure projects.
- Alignment with Legislative Reforms: We consider this project to be an excellent candidate for fast-track consideration, given its involvement with multiple legislation, regulations, plans, and policies. (Local Government Act 2002, Resource Management Act 1991, Heritage New \Zealand Pouhere Taonga Act 2014, Land Transfer Act 2017 and Wildlife Act 1953). The proposal aligns with Government reforms aimed at accelerating nationally and regionally important infrastructure development, minimising delays, and navigating the bureaucratic complexities that currently hinder such essential projects. It exemplifies how the complexity of obtaining various statutory approvals can introduce uncertainty, delays, and costs that are disproportionate to the project's environmental effects, underscoring the necessity for a streamlined process. This project will progress faster, and therefore provide its benefits faster, by using the processes under the new fast track legislation than would otherwise be the case. Delayed consenting under the standard RMA process will constrain potential supply from the Hunua Quarry.
- Support for Regional and National Infrastructure: Referring this proposal to fasttrack consenting will ensure that Hunua Quarry is able to support the numerous Auckland wider ongoing and future infrastructure projects, vital for the economic and social well-being of the Auckland region and New Zealand.
- Sustainable and efficient development: Emphasises environmental stewardship and sustainable resource management, ensuring the project not only meets the immediate needs of the construction industry but does so in an environmentally responsible manner.
- Trusted operator: Winstone Aggregates are an experienced and trusted national operator with a good environmental track record. We have extensive experience in developing and operating quarry projects and have successfully operated the Hunua Quarry since the 1950's.

Page 5



- Economic impact and efficiency: Highlights the cost-saving and logistical benefits
 of local aggregate supply, crucial for the timely and budget-friendly completion of
 infrastructure projects, further justifying the need for the fast-track approval
 process.
- Shovel ready: Winstones would look to immediately start design a new site layout and procurement of new equipment for the increased production. The site development itself would be staged to increase production as the large infrastructure projects come online.

The Hunua Quarry Development exemplifies a proactive and strategic approach to meeting New Zealand's infrastructure challenges, aligning with the Government's vision for streamlined development and sustainable growth. It is well suited for consideration via the fast-track approvals process.

Page 6



1. Introduction:

Winstone Aggregates established Hunua Quarry in 1956, marking the inception of one of Auckland's largest and most crucial greywacke rock production sites. Nestled within the Hunua hills the quarry has significantly bolstered the region's supply of high-quality aggregates, primarily utilised in critical infrastructure developments such as roading and concrete construction. The strategic establishment of Hunua Quarry has enabled it to deliver substantial volumes of essential materials, underpinning numerous regional development projects over the decades.

Winstones has put forward the Hunua Quarry Development proposal for consideration as a suitable candidate for referral under the new Fast-Track Approvals Bill to more rapidly enable the quarry to continue to maximise its operation and strategic growth and maintain its support of regional and national projects.

Hunua Quarry, currently responsible for approximately 28% of Auckland's total aggregate production, is a cornerstone in the region's construction material supply chain. As Auckland faces a growing aggregate deficit, with the region importing about 4.5 million tonnes in 2022, the quarry's output is more vital than ever. Without expansion, the quarry is expected to reach its production capacity within the next decade, thereby worsening the regional supply shortfall. The proposed expansion aims to increase the quarry's annual production capacity from $\frac{s 9(2)(b)(ii)}{s 9(2)(b)(ii)}$ which would significantly mitigate the impending deficit.

Its key location, about 40km from Auckland's CBD and just over 8km to the closest Southern Motorway on and off ramps, highlights its critical importance. This proximity is especially significant as other similar resources have become inaccessible over time due to urban development. With the ever increasing development demand for residential and infrastructure projects this will gradually put significant pressure on the region's aggregate resources.

The current structure of the RMA consenting pathways results in significant uncertainty for applicants, including in respect of costs and delays. The Infrastructure Commission's

Confidential and Commercially Sensitive:



report¹ on this issue highlights the financial and time-related burdens infrastructure developers face under the current RMA framework. Developers collectively spend \$1.29 billion annually on consenting, with costs averaging 5.5% of a project's total budget. The report also notes an increase in complexity and costs over time, with the average decision time for consent applications rising by 50% since 2014/15, and up to 150% for infrastructure projects specifically.

Having a secure supply of quality aggregate close to demand is critical for project cost control. Once a load of aggregate is taken more than 30km from a quarry, the consumer is generally paying more in cartage costs than for the actual aggregate² e.g. the cost of aggregate at least doubles when it is demanded more than 30km from its source. It is disappointing that some aggregate for Transmission Gully had to be sourced as far away as Mt Taranaki (300km distance) due to a shortage of local supply which not only has economic impacts but also environmental impacts of increased transport emissions.

2. Background

Winstone Aggregates, a division of Fletcher Concrete and Infrastructure Limited (FCIL), part of the Fletcher Building group, holds a prominent position in the aggregates industry in New Zealand. With a rich history dating back to the 19th century, over the last 150 years+, Winstones has established itself as the largest manufacturer and distributor of aggregates in the country. The company operates numerous extraction sites across New Zealand, including the Auckland region, where it plays a significant role in meeting the demand for aggregates.

In the Auckland region, Winstones operates two quarries, Hunua Quarry and Flat Top. There is an additional joint venture operation Rodney Aggregates Supplies in Whangaripo to the north. These operations provide a local and reliable source of aggregates for various construction projects in the region. Winstones' quarries in the Auckland area have been longstanding contributors to the Auckland market, supplying essential materials for

¹ The cost of consenting infrastructure projects in New Zealand, A report for The New Zealand Infrastructure Commission / Te Waihanga, July 2021

² https://aqa.org.nz/fact-files/

Confidential and Commercially Sensitive:



roading, construction, and infrastructure development. The major competitor to Hunua is Stevenson's Drury Quarry, in relatively close proximity to Hunua. Brookby Quarry, in East Auckland, is the other major quarry in the wider area to note.

The initial Hunua pit, which served the quarry from 1956, concluded its operations in 2017, transitioning into what is now known as the Hunua Managed Fill. This evolution reflects the quarry's ongoing adaptation to the geological and market demands throughout its operational history.

In 2016, operations expanded with the opening of the Symonds Hill area within the Hunua Quarry, marking the second major extraction area within the quarry's zone. This new phase aimed to extend the quarry's life and increase its production capacity, thereby ensuring the continued supply of greywacke rock essential for Auckland infrastructure needs. The development of this new extraction area was accompanied by comprehensive environmental impact assessments and the implementation of advanced resource management systems, designed to minimise the environmental footprint of the quarry's operations.

Hunua Quarry, in particular, is a vital source of aggregates for the greater Auckland region. It is not just the quarry's operation that is crucial for the supply chain but also the interconnected ecosystem of businesses reliant on its output:

- Winstone Aggregates: 52 permanent employees; and
- **Contractors:** Additionally, between 20 to 50 contractors work across all sites, further supporting the quarry's operation.

Direct Employment Impact: The expansion of the Hunua Quarry is expected to contribute significantly to local employment. Over the lifetime of the project (up to 80 years), the operation of the extended quarry is projected to support the employment equivalent to 1,980 workers working full time for a year. This includes jobs directly involved in the quarry operation as well as indirect employment generated by the expansion.

Page 9



Total Effects on Employment: Considering both direct and indirect impacts, the economic activity generated by the quarry expansion sustains employment equivalent to 5,100 full-time work years.

This ecosystem of businesses, directly reliant on Hunua Quarry, highlights its importance not just as a supplier but as a cornerstone of the regional economy. The efficiency gained from having these operations co-located with the quarry, as opposed to the significant costs and logistical challenges of carting aggregate from further afield, cannot be overstated. Such a setup ensures a steady, cost-effective supply of materials crucial for the region's infrastructure projects, underlining the quarry's significance to Hunua's ongoing development and economic health.

Government infrastructure

The draft Government Policy Statement on Land Transport (GPS) 2024 outlines the strategic direction for New Zealand's transport network, focusing on enhancing economic growth and productivity, resilience, and safety while ensuring value for money in transport investments. It guides expenditure from the National Land Transport Fund and influences regional and national transport planning.

The GPS emphasises the government's commitment to both new and improved infrastructure projects and the maintenance of existing transport networks. As part of this strategic approach, the GPS identifies a suite of significant projects in the Auckland region, each of which is expected to contribute to the overarching goals of the GPS. These projects are:

- City Rail Link
- North West Alternative State Highway
- Second Waitematā Harbour Connections
- Ō Mahurangi Penlink
- South Auckland package
- SH1 Papakura to Drury
- East West link
- Mill Road
- Eastern Busway

Confidential and Commercially Sensitive:



- Airport to Botany
- Northwest Rapid Transit
- Warkworth to Wellsford

Figure 1: Auckland Road Programme – Winstone Aggregates Quarries

Collectively, these 12 key projects in Auckland will create substantial demand for aggregates, necessary for construction and infrastructure development. The successful execution of these projects will rely on the continuous and efficient supply of high-quality aggregates to meet the extensive construction needs, from concrete production to roading materials. The GPS not only ensures the strategic alignment of transport investment but also indirectly influences related industries, such as quarrying and aggregate production, that are vital for the materialisation of these transport initiatives.

Confidential and Commercially Sensitive:



3. Economic Contributions of Hunua Quarry

The Hunua Quarry expansion proposal by Winstone Aggregates is strategically positioned to address the critical shortage of aggregate in Auckland, which is indispensable for the region's extensive infrastructure development and overall economic growth. Winstones has engaged Market Economics to undertake a comprehensive economic assessment on a the potential Hunua Quarry Development. The full assessment is in Appendix B: Economic Report, the following section is a summary of the key points.

Market Contribution and Capacity Expansion:

Hunua Quarry's current output comprises approximately 28% of Auckland's total aggregate production, making it a key player in the region's construction material supply chain. However, Auckland's aggregate market is facing a severe deficit, exacerbated by the lack of new quarry developments and the limited expansion of existing operations. Currently, the region imports about <u>4.5 million tonnes of aggregate annually</u>, primarily from Northland and Waikato, which incurs significant transportation costs and environmental impacts.

The proposed expansion aims to significantly enhance the quarry's production capacity from ^{s 9(2)(b)(ii)} This increase is critical to prevent the quarry from reaching its existing capacity limits within the next decade and worsening the regional supply shortfall.

Economic Benefits of Enhanced Production:

- Reduction in Imported Aggregates: By increasing local production, the project will decrease Auckland's reliance on costly imported aggregates. This shift will not only stabilise prices by reducing the economic costs associated with transportation but also align with environmental sustainability goals by minimising carbon emissions from transport activities.
- Cost Savings from Reduced Transportation: The expansion is projected to substantially reduce transportation distances for aggregate delivery within the region, thereby decreasing the associated costs and environmental impacts. These

Page 12



savings are crucial for enhancing the cost-efficiency of construction projects across Auckland, contributing to more sustainable urban development.

 Direct Economic Output: The expansion involves an estimated capital investment of over \$ 9(2)(b)(ii) into the local economy over the quarry's operational life. This investment is expected to create direct employment opportunities at the quarry and stimulate further economic activity across related sectors such as logistics, machinery maintenance, and construction services.

Demand Dynamics and Projected Shortfalls:

The demand for aggregate in Auckland is expected to increase significantly, driven by robust population growth and ongoing infrastructure developments. Projections indicate that existing sources will become insufficient over the next two decades, highlighting the strategic necessity of the Hunua Quarry expansion. This expansion is designed to not only double the current production capacity and also extend the operational life of the quarry by up to 80 years, effectively addressing the forecasted regional aggregate deficit.

Sustainability and Environmental Management: The Hunua Quarry expansion incorporates comprehensive environmental management strategies to mitigate the impacts of increased production. Winstone Aggregates is committed to sustainable quarrying practices, ensuring that there would be no reduction In environmental standards. Key measures include:

- Enhanced Local Sourcing: By increasing the supply of locally sourced aggregate, the project significantly cuts down on emissions and resource usage associated with long-distance transportation of materials from other regions.
- Advanced Stormwater and Waste Management: Implementing state-of-the-art stormwater management and waste recycling systems to ensure environmental compliance and minimize the impact on surrounding ecosystems.

Investment and Employment Benefits: The development project is a major economic initiative with significant capital expenditure that will stimulate local employment and economic activities. The investment of over ${}^{s \ 9(2)(b)(ii)}$ is anticipated to:

• **Directly Enhance GDP**: Contribute substantially to the regional GDP through direct operations and associated industries.

Page 13



- Create Job Opportunities: Directly support hundreds of jobs at the quarry and in related sectors, including transportation and construction services. The project will also indirectly support employment through increased demand for local services and supplies.
- Stimulate Economic Activity: The influx of capital and jobs will generate secondary economic benefits across the Auckland region, enhancing overall economic stability and growth.

Strategic Importance and Long-term Regional Benefits: The strategic increase in Hunua Quarry's production capacity is essential to meet the current and future construction needs of Auckland. The project supports:

- Infrastructure Development: Ensuring a reliable supply of aggregate is crucial for the construction of roads, residential and commercial buildings, and public utilities, all foundational to Auckland's growth.
- Economic Resilience: By providing a stable source of essential materials, the quarry helps mitigate the risk of material shortages that can lead to project delays and increased costs, thereby maintaining economic momentum.
- **Regional Economic Policies**: Supporting regional economic policies aimed at enhancing employment rates and economic output, particularly in sectors dependent on construction and infrastructure.

The Hunua Quarry development is crucial for ensuring a stable and cost-effective supply of aggregate, vital for supporting Auckland's ongoing and future infrastructure requirements. The Hunua Quarry Development not only addresses immediate and future market demands but also aligns with regional economic goals, making it a prime candidate for fast-track approval processes.

The comprehensive economic benefits, coupled with a focus on environmental sustainability and community engagement, highlight the necessity for timely approval to realise these benefits. This expansion will significantly contribute to the sustainable development of Auckland, supporting its growth as a dynamic urban centre.

Page 14



This detailed economic assessment underlines the Hunua Quarry expansion as a critical infrastructure project poised to deliver substantial long-term benefits to Auckland and the broader New Zealand economy.

4. Project Scope and Description:

Winstone Aggregates proposes a significant increase in Hunua Quarry production to meet the forecasted demand for aggregates driven by Auckland's infrastructure growth. The quarry is currently operating near its maximum capacity and risks reaching its limits once major projects begin. The consideration for the long term plan is to work within the current ownership footprint for the Quarry. From an environmental and economic perspective, maximising existing sites is the priority for the business.

Current Operations and Capacity Challenges

With the potential projects requiring a reliable supply of quality aggregate that have been indicated on progressing in the medium term Hunua Quarry is on the brink of reaching its capacity under existing approvals, highlighting the urgent need for expanded operational capabilities to ensure continuous supply. With the current estimate pipeline, within 2 to 5 years Hunua would hit capacity. This section underscores the importance of enhancing efficiency through a comprehensive review of current site operations and resource potential.

Strategic Resource Expansion

The Winstones team has completed a resource assessment which indicates that the Greywacke resource extends beyond the current consented quarry boundaries, suggesting significant untapped potential. This discovery supports the need for a strategic expansion, which includes adopting Fast Track legislation to streamline the approval process for a more comprehensive pit design. This expansion aims to secure resource availability for the next 40+ years, aligning with Auckland's growth needs.

Please refer to Appendix D: Engineering drawings which outlines the pit that is proposed and the resource.

Confidential and Commercially Sensitive:



s 9(2)(b)(ii)

Greywacke Resources

There are substantial greywacke resources that will provide an excellent source of rock aggregate immediately adjacent to the currently consented and operating quarry. These resources are inside properties owned by Winstones, and it is these resources that will allow Winstones to continue supplying much needed rock aggregates to support the future growth and development of Auckland.

The existence and continuity of greywacke inside the Hunua Quarry Development area is well documented and supported by historical geological literature, field mapping, and

Confidential and Commercially Sensitive:



79 drill holes that have intersected greywacke, both inside and outside the Hunua Quarry Development area.

The surface geology map³ shown in Figure 3 below illustrates the extents of greywacke, in places overlain by Waitemata and Te Kuiti group overburden, in relation the Hunua Quarry Development area. The location of drill holes that have intersected the greywacke are also shown.



Figure 3 – Geology Map, Hunua Quarry Development Area, Drill Holes Intersecting Greywacke

Continuity of Greywacke

There are 79 drill holes that have been drilled in the vicinity of the Hunua Quarry Development area that intersect greywacke. To validate the continuity of greywacke

Confidential and Commercially Sensitive:

³ 1:250 000 Geological Map of New Zealand



resource across the Hunua Quarry Development area the drill holes were evaluated in cross section along several cross-section lines.

The locations of the cross-section lines, drill holes and the Hunua Quarry Development area are shown in Figure 4 below. s 9(2)(b)(ii)

The cross sections produced along these lines, showing the drill holes and the continuous upper surface of the greywacke resource (RED), are shown in Figure 5 below.

Confidential and Commercially Sensitive:

Contains information that would unreasonably prejudice the commercial position of Winstone Aggregates if released Page 18



Confidential and Commercially Sensitive: Contains information that would unreasonably prejudice the commercial position of Winstone Aggregates if released Page 19



Quarry Pit Design

Two scenarios of quarry pit were designed and evaluated for the extraction of greywacke from within the Hunua Quarry Development area.

s 9(2)(b)(ii)

Quarry Pit Design Parameters

Quarry pits were designed using an average pit wall angle of 35 degrees, the recommended slope to ensure safe operation. This was based on the final pit design for the current Hunua Quarry, and it accommodates haul roads, benches, and batter slopes for both greywacke and overburden that will be included in subsequent detailed design. Figure 6 below shows a cross-section illustrating how the average pit wall angle was measured from the bottom to the top of the final pit design.

Confidential and Commercially Sensitive:



Scenario-A quarry pit design is shown in Figure 7 below, and Scenario-B in Figure 8 with the location of cross-section lines that are used to examine the pit designs.

Confidential and Commercially Sensitive: Contains information that would unreasonably prejudice the commercial position of Winstone Aggregates if released Page 21



Confidential and Commercially Sensitive: Contains information that would unreasonably prejudice the commercial position of Winstone Aggregates if released Page 22



s 9(2)(b)(ii)

Confidential and Commercially Sensitive: Contains information that would unreasonably prejudice the commercial position of Winstone Aggregates if released Page 23



Confidential and Commercially Sensitive: Contains information that would unreasonably prejudice the commercial position of Winstone Aggregates if released Page 24





Rock Aggregate Estimates

Estimates of rock aggregate production from greywacke contained within each of the Scenario-A and Scenario-B pit designs have been made.

The planned Hunua Quarry Development for either Scenario-A and Scenario-B will provide aggregate production that can meet projected future market demand for in s 9(2)(b)(ii)

	Quarry Production Totals		
	Aggregate	Years of Rock	
	(Million Tonnes)	Production	
Scenario-A	s 9(2)(b)	s 9(2)(b)	
Scenario-B	(ii)	(ii)	

Confidential and Commercially Sensitive:



Environmental Considerations and MitigationThe expansion plan includes the development of a large portion of the currently ownedland, which will involve removing $$^{\$ 9(2)(b)(ii)}$ Thisincludes $$^{\$ 9(2)(b)(ii)}$ and $$^{\$ 9(2)(b)(ii)}$ Thiss 9(2)(b)(ii)Winstones is committed to mitigating environmentalimpacts through a proposed $$^{\$ 9(2)(b)(ii)}$ plan that will ensure a net positiveenvironmental impact. There is also $$^{\$ 9(2)(b)(ii)}$ to the south of the quarry. To reachthe $$^{\$ 9(2)(b)(ii)}$ for the site $$^{\$ 9(2)(b)(ii)}$

5. Legislative framework and approval Requirements

The expansion aligns with the proposed fast-track process outlined in new legislation, which acts as a one-stop shop for obtaining necessary approvals. This streamlined approach is essential for keeping pace with the rapid development projects in Auckland, ensuring that Hunua Quarry can meet the region's aggregate supply needs efficiently.

Winstone anticipates that the following consents/ approvals/ permits would be required for the entire project:

Statute	Brief Description of approval required:
Local Government Act 2002	Approval for road closures
Resource Management Act 1991	Resource consent (land use consent) for the proposal from Auckland Council under the Part-Operative Unitary Plan. Relevant land use consent(s) would be required in perpetuity.
	Resource consent would be sought from Auckland Council for various activities under the Natural Environmental Standard for Freshwater and National Policy Statement for

Table 2: Approval requirements

Confidential and Commercially Sensitive:



Statute	Brief Description of approval required:		
	Indigenous Biodiversity. It is anticipated that the consents required would include: (but not limited to) water permits for diversion and taking of water; discharge consents to water and to air; land use consent for works within rivers and wetlands; and land use consent for bulk earthworks and cleanfilling. A duration of a minimum of 35 years would be sought for those regional consents.		
	 Resource consents would require robust planning assessment against the following planning documents: Auckland Unitary Plan 2015 National Policy Statement for Freshwater Management 2020, National Policy Statement for Indigenous Biodiversity 2023, and The Resource Management Act (Part 2). Past experience is that consents of this nature would be publicly notified and subject to full Council level hearings, potential appeal (or full Environment Court hearing as a direct referral). 		
Heritage New \Zealand Pouhere Taonga Act 2014	Archaeological approval (if required) in connection with bulk earthworks where an archaeological site is uncovered or altered.		
Land Transfer Act 2017	To register, vary and amend existing easements across proposal site.		
Wildlife Act 1953	Wildlife permits to authorise the translocation of any indigenous fauna. Any necessary permits e.g. for gecko relocation etc.		

6. Potential Environmental Effects

The Hunua Quarry Development proposal is crucial for expanding the quarry's operational capacity to meet the burgeoning demand for aggregate in the Auckland region. This expansion is not only pivotal for sustaining regional infrastructure development but also crucial for maintaining the economic vitality of the area. This assessment of potential effects evaluates the potential environmental impacts associated with the proposed

Confidential and Commercially Sensitive:



expansion, incorporating substantial environmental considerations into every phase of the development process.

Site Description and Physical Environment

The Hunua Quarry is strategically situated within a geologically significant area, renowned for its rich deposits of greywacke rock. The quarry's proximity to major transport routes and its critical role in supplying essential construction materials make it an indispensable element of the local infrastructure supply chain.

Proposed Activities

The proposed activities involve extensive land clearing, soil removal, and the establishment of new access roads and infrastructure required for the expanded operations. This development is designed to ensure the quarry continues to meet the regional demand for aggregates effectively and sustainably.

Potential Effects

Visual and Landscape Effects

The proposed expansion involves the altering of ^{\$ 9(2)(b)(ii)} of land, which will result in significant changes to the landscape. Careful design considerations have been made to ensure that these alterations are managed in a manner that maintains an acceptable level of visual impact.

Noise and Vibration

Given Hunua Quarry's longstanding operational history, the management of noise and vibration is well-established. The quarry is located sufficiently away from residential areas, minimising potential impacts. Noise levels will continue to be managed within existing consent limits, utilising advanced noise suppression technologies and operational management plans that restrict high-noise activities to daytime hours. The Quarry will not exceed noise limits at the notional boundaries and comply with the standards.



Air Quality and Dust

Existing dust management practices at Hunua Quarry have been effective and will be enhanced to ensure continued compliance with air quality standards.

Water Management

The quarry features robust stormwater management systems, which will be extended to cover the expanded operations. The design and staging of overburden placement and the final landforms will incorporate effective stormwater management strategies to prevent any adverse impacts on local waterways.

Traffic and Transportation

There will be an increase in external traffic to the site, even though the proposed development will primarily increase internal traffic. Traffic Impact Assessment to determine the impact on the wider network and the mitigation will be undertaken. This management strategy ensures minimal impact on the surrounding road network.

Archaeological and Cultural Effects

In-depth consultations with mana whenua are integral to the project, ensuring respect for the site's cultural heritage. An archaeological assessment has confirmed that there are no known significant sites within the development footprint, allowing for culturally informed and respectful development. Four mana whenua partners have been invited to conducted Cultural Values Assessment on the entire site, the feedback from mana whenua will inform the final design of the site and pit.

Ecological Impacts

The proposed expansion of Hunua Quarry recognizes the presence of significant ecological areas across the site. It is understood that some of these areas will be affected by the planned development activities. In response to this, Winstone Aggregates is committed to conducting a comprehensive Ecological Management Plan for the site. This plan will focus on identifying and highlighting areas suitable for restorative planting to compensate for the ecological spaces lost due to the expansion.

Confidential and Commercially Sensitive:



The Ecological Management Plan will include detailed biodiversity strategies, such as the relocation of native species. Winstone Aggregates has a successful history of relocating species, exemplified by our previous gecko relocation initiatives, which have contributed positively to biodiversity preservation. These activities demonstrate our capability and commitment to effectively manage and enhance the ecological values of our operational areas.

In ensuring the success of these environmental management efforts, Winstone Aggregates will collaborate closely with mana whenua, Auckland Council and the Department of Conservation. This collaboration will ensure that the management of the site's ecological aspects is conducted responsibly and sustainably, aligning with both regulatory requirements and community expectations. Through these partnerships, we aim to promote a balanced approach to quarry development while actively contributing to ecological restoration and biodiversity enhancement in the region.



Figure 11: Auckland Council Zone boundaries and Significant Ecological Areas

Confidential and Commercially Sensitive:



Mitigation Measures

Mitigation strategies are focused on minimizing the environmental footprint of the quarry expansion. These include restoring native vegetation, continuous monitoring of noise and dust, and active engagement with the community to address any concerns from local residents and stakeholders.

Monitoring and Management Plans

A comprehensive monitoring program will be implemented to assess the effectiveness of the mitigation measures. Adaptive management plans will be in place to adjust strategies based on monitoring outcomes, ensuring ongoing environmental protection.

Conclusion

The proposed expansion of Hunua Quarry is expected to have manageable environmental effects through the implementation of robust mitigation and management strategies. The project commits to maintaining high standards of environmental stewardship, ensuring the operation continues to support regional infrastructure development sustainably.

7. Te Tiriti o Waitangi (Treaty of Waitangi) Settlements, arrangements and commitments that impact the proposal.

There are no Te Tiriti o Waitangi (Treaty of Waitangi) Settlements on the subject site or surrounding land.

Summary Table of Iwi Group Discussions at Hunua Quarry

Winstones has strong relationships and partnerships with multiple mana whenua and tangata whenua dating back many dating back twenty years. As part of the works programme for the site a number of discussions have been held with mana whenua. Once the fast track bill was announced the potential for Hunua Quarry Development to be submitted to the fast track has been tabled with mana whenua.

Confidential and Commercially Sensitive: Contains information that would unreasonably prejudice the commercial position of Winstone Aggregates if released

Page 31



Date	lwi Groups	Main Discussion Points	Participants
	Involved		
25 May 2023	Ngāti	- Karakia and Mihi Whakataua. Winstone	Jeff Lee <mark>(</mark> Te Ākitai Waiohua),
	Tamaoho,	Aggregates' values and relationship with	Edith Tuhimata (Ngāti
	Te Ākitai	mana whenua Long-term site	Tamaoho), Karl Flavell (Ngāti
	Waiohua,	development interests of all mana whenua	Te Ata) David Fraser (Ngāti Te
	Ngāti Te	groups.	Ata), Amanda Croft,
	Ata	 Cultural induction and site visit planning. 	Mitch O'Kane, Chris Edmonds,
			lan Wallace, Wiremu Tamati
			(Te Ākitai Waiohua), Dan
			McGregor, Tim Evans, Phil
			Heffernan <mark>(</mark> all Winstone
			Aggregates)
24 Aug 2023	Te Ākitai	- Karakia, Whakawhanaungatanga.	Jeff Lee <mark>(</mark> Te Ākitai Waiohua),
	Waiohua,	Construction of new Haul Road.	Ben Leonard (Ngāti Tamaoho),
	Ngāti	 Positive Biodiversity Strategy discussed. 	Mitch O'Kane, Ian Wallace,
	Tamaoho	Gecko relocation project updates.	Chris Edmonds, Tim Evans,
			Phil Heffernan, Mary-Jane
			Vavetuki (all Winstone
			Aggregates),
19 Apr 2024	Ngāti	- Karakia, Whakawhanaungatanga.	Jeff Lee <mark>(</mark> Te Ākitai Waiohua),
	Tamaoho,	 Quarry site updates including compliance and 	Edith Tuhimata (Ngāti
	Te Ākitai	machinery updates.	Tamaoho), David Fraser (Ngāti
	Waiohua,	-Discussions on Positive Biodiversity Strategy.	Te Ata),
	Ngāti Te	-Consideration of cultural and ecological	Mitch O'Kane, Ian Wallace,
	Ata	impacts in future plans.	Ming Lee, Rayya Ali, Phil
		- Fast Track consenting for Hunua Quarry	Heffernan <mark>(</mark> all Winstone
		Development	Aggregates)
1 May 2024	Ngāi Tai ki	- Quarry site updates.	Revell Butler (Ngāi Tai ki
	Tāmaki	-Discussions on Positive Biodiversity Strategy.	Tāmaki)
		-Consideration of cultural and ecological	Mitch O'Kane, Ian Wallace,
		impacts in future plans.	Phil Heffernan (all Winstone
		-Fast Track consenting for Hunua Quarry	Aggregates)
		Development	



8. Project Details and Optimal Development:

Long-term Sustainable Development Strategy:

With Auckland growing at a fast rate, and additional transport and land developments coming online, the security of supply is essential to ensure that the Infrastructure and residential developments continue to be supplied.

With the anticipated increased demand from the infrastructure projects and land development projects that are in the public and private sector. It is anticipated in the medium term that Hunua Quarry will not have sufficient consented resource to supply the Auckland and Waikato markets.

Development without proposal:

Without the increased approvals for Hunua there is potential that Hunua will be at capacity for production ${}^{s \ 9(2)(b)(ii)}$ If this occurs, then the aggregate required for the infrastructure projects will have to be sourced from outside the Auckland area.

Development proposal:

- With an increase in the pit yield that is proposed the business can commit more additional capital expenditure to the site to facilitate more production. Over the lifetime^{S 9(2)(b)(ii)} Winstones expect to invest more thar^{S 9(2)(b)(ii)} to establish and operate the extended quarry. In total the plans will yield more than ^{S 9(2)(b)(ii)} of aggregate. There reason is the future long term certainty of the resource, coupled with the increase in proposed infrastructure and land development ensures that business can make the investment in the longer term equipment needed.
- This approach provides ample capacity for the long-term development of the quarry, ensuring a steady supply of aggregate materials.
- The expansion also creates opportunities to enhance local biodiversity and recreational amenities as part of the area's rehabilitation process. Collaboration with local iwi partners, the Department of Conservation, and Auckland Council will be integral to integrating environmental and community benefits into the quarry's development plans.

Page 33



Operational excellence:

Winstone Aggregates' commitment to operational excellence and environmental stewardship is demonstrated through its history of compliant and innovative. We pride ourselves on being sector leaders in all metrics.

Quarry development conclusion:

The comparative analysis underscores the necessity of a Development for the long-term, sustainable development of Hunua Quarry. This strategy not only supports the operational needs of the quarry but also contributes positively to the regional ecosystem and community.

9. Alternatives and Options

There is no viable alternative option to the proposal. Development of the quarry has been considered to grow to the east and over the road to the north. Both these options involve land that is not owned by Winstone Aggregate's and also does not have the yield or meets the proposal timeframes.

10. Timeframe and Efficiency Gains:

Business certainty is paramount for investments in long-term projects like Hunua Quarry. Without Government intervention, Winstone anticipates a 5-year timeline to secure all necessary approvals, with a large project risk profile associated. This protracted process, potentially commencing works by 2029/2030, could constrain operations in the short term and affect quarry productivity. However, if the project is selected for the referral process, this timeline could be significantly reduced, enabling Winstone to commence the purchase of new equipment and commence works much sooner. This acceleration not only enhances business certainty and operational efficiency but also mitigates inflationary pressures on a crucial construction material by reducing consenting delays and costs and ensuring timely supply.

> Confidential and Commercially Sensitive: Contains information that would unreasonably prejudice the commercial position of Winstone Aggregates if released

> > Page 34



11. Conclusion:

The Hunua Quarry Development proposal aligns with key national priorities, reflecting a strategic approach to resource management and infrastructure development:

- **Regional and National Significance:** The proposal is crucial for the Auckland region and New Zealand, ensuring the availability of essential aggregates for critical infrastructure, underscoring its importance at both regional and national levels.
- Alignment with Fast-Track Consenting: Demonstrates readiness to proceed under the proposed fast-track consenting process, facilitating significant infrastructure developments efficiently and with the speed required to deliver the benefits to Auckland and New Zealand as demanded by the current pipeline of key infrastructure projects.
- Environmental and community stewardship: Committed to high environmental standards, aligning with governmental emphasis on sustainable management of natural resources. This proposal potentially going a Fast-Track pathway, does not change the high standards that Winstones sets for its sites, its developments, and its people.
- Government stakeholders: Winstones will continue ongoing proposal engagement with stakeholders, such as Auckland Council.
- Iwi partners: Winstones has existing relationships with a number of local iwi, such as Ngāti Tamaoho, Te Ākitai Waiohua, Ngāti Te Ata, and Ngāi Tai ki Tāmaki. Winstones proposes to build these into stronger partnerships in the coming years
- Contribution to National Prosperity: Positioned to significantly contribute to New Zealand's economic and infrastructural prosperity under the new legislative paradigm.
- Providing business certainty. Accelerating this proposal under the fast-track process not only solidifies business certainty and enhances operational efficiency but also plays a pivotal role in alleviating inflationary pressures on key construction materials. By streamlining the consenting process, we ensure a reliable and timely supply, effectively managing costs and supporting the construction sector's stability.

Page 35



This proposal represents a proactive step towards addressing both regional needs and national infrastructure goals, showcasing a model for future projects within the Government's strategic framework.


Appendix A: Record of Titles

Confidential and Commercially Sensitive: Contains information that would unreasonably prejudice the commercial position of Winstone Aggregates if released Page 37

winstoneaggregates.co.nz



Appendix B: Economic Report

Confidential and Commercially Sensitive: Contains information that would unreasonably prejudice the commercial position of Winstone Aggregates if released Page 38

winstoneaggregates.co.nz

Hunua Quarry – Winstone Aggregates High level assessment of economic effects for Fast-track approval

3 May 2024





Hunua Quarry – Assessment of Economic Effects

Prepared for Winstone Aggregates Ltd.

1 ()	s 9(2)(a)
Report author(s):	Greg Akehurst
Date of this version:	3 May 2024
Document reference:	WAG 001.24

www.me.co.nz

Disclaimer: Although every effort has been made to ensure accuracy and reliability of the information contained in this report, neither Market Economics Limited nor any of its employees shall be held liable for the information, opinions and forecasts expressed in this report.



Contents

1	INTRODUCTION 1
1.1	REPORT OBJECTIVES
1.2	INFORMATION SOURCES
1.3	Structure
2	AGGREGATE MARKET AND OUTLOOK 1
2.1	DEMAND PATTERNS – NATIONALLY AND AUCKLAND REGION
3	HUNUA QUARRY APPLICATION 1
3.1	CURRENT AND FUTURE PRODUCTION
3.2	Fast Track consent criteria
4	REGIONAL AND NATIONAL BENEFITS
4.2	AUCKLAND'S SIGNIFICANCE TO NEW ZEALAND
4.3	ECONOMIC IMPACTS OF HUNUA QUARRY EXPANSION
4.4	TOTAL BENEFITS
5	CONCLUSIONS

Figures

FIGURE 2.1: REGIONAL AGGREGATE DEMAND AND PRODUCTION, 2023	3
FIGURE 2.2: AUCKLAND REGION AGGREGATE OUTPUT SHORTFALLS, 2023 – 2048	4
FIGURE 3.1: AUCKLAND REGION FUTURE DEVELOPMENT STRATEGY, NOVEMBER 2023	1
FIGURE 4: CONSTRUCTION EFFECTS OF EXPANDING HUNUA QUARRY, 2025 - 2097	9
Figure 5: Present Value of Total Benefits ($M NPV_{5\%}$) – Scenario 1 – existing consents expire	14
FIGURE 6: PRESENT VALUE OF TOTAL BENEFITS (\$M, NPV5%) – SCENARIO 2 – EXISTING CONSENTS ENDURE	14



1 Introduction

Auckland is New Zealand's largest city, and main economic service centre. The city is experiencing strong population growth and despite challenging economic conditions associated with the inflationary period, investment in buildings and infrastructure is ongoing. In addition to the demands associated with growth patterns, there are significant infrastructure deficits. The Infrastructure Commission highlights this shortfall and suggests that a business-as-usual approach to renewals and investment will see the deficit grow. The historical deficit arose out of an investment slump during the 1980s and 1990s and investment during the 2000s has not been sufficient to meet infrastructure demands.

Cost effective infrastructure relies on the construction sector being able to deliver projects efficiently, which means that the entire supply chain must be efficient to ensure that can occur. A central message is that a simplistic approach to building our way of the deficit is unlikely to succeed. Instead, infrastructure efficiency, and maximising the return on infrastructure spending, are critical. Estimates suggest New Zealand's infrastructure spending would need to increase from 5.5% of GDP to 9.6% of GDP to deliver the infrastructure we need – a significant increase. This level of increase cannot occur in isolation and with limited financial resources, difficult trade-off will be needed reflecting decisions between hospitals, schools, housing, and other areas.

The degree to which access to cost effective raw materials such as aggregate and sand is achieved will play a critical role in providing cost effective infrastructure. Aggregate is a foundation and a binding product, used as primary raw material in construction, and is integral for concrete and roading projects. Concrete, which requires aggregate, is used in every aspect of development and across the economy. Transport infrastructure connects economic activities, enabling transactions and the movements of people, goods, and services. Without a ready and reliable supply of appropriately located aggregate, delivering the infrastructure to support growth will be considerably more difficult, adding costs and delays to the process, while also reducing wellbeing.

Concrete is used throughout the urban environment to meet the needs of residential, business and road construction requirements. Given the importance of concrete for Auckland's economy, Auckland's built future is effectively reliant upon maintaining sustainable sources of aggregate. Because aggregate is a key component in a range of different building applications, much of New Zealand's future productive growth is reliant on aggregate in one form or another. This means that the impact of aggregate extends significantly further than just the construction sector.

Winstone Aggregates are seeking to secure their investment future in the Hunua Quarry by seeking consent to extend the extraction life of the quarry in line with market demand overs 9(2)(b)(ii) and seeking consent to expand the quarry's output. Hunua quarry, due to its location is facing reverse sensitivity issues as urban expansion pushes up against its boundary.

This is occurring in an Auckland aggregate market that is already in deficit. As outlined in Section 2 below, the region imported around 4.5m tonnes of aggregate in 2022, this is expected to rise significantly over the next 20 - 30 years as no new quarries are expected to come online. Enabling new supplies from existing quarries within the region minimises economic and environmental costs and helps ensure infrastructure, housing and economic growth are delivered efficiently and effectively.

Expanding aggregate supply faces numerous additional challenges in the existing policy landscape. Some key issues are listed below.



- The tight labour market and lack of workers with the requisite skills make finding new or replacement staff difficult.
- Energy grids are under strain and raising energy can be unfeasible in some scenarios.

These issues add complexity to production. Moreover, they make it harder to respond to changes in demand, entrenching the supply shortfall in Auckland.

1.1 Report objectives

Hunua Quarry is looking to secure its investment future by seeking a Fast Track consent to continue operations over the next s 9(2)(b)(ii) and to expand aggregate extraction up to s 9(2)(b)(ii) annually, in line with market demand.

Hunua Quarry is well located with respect to significant growth areas in the southern part of the city and a number of new roading infrastructure projects are occurring in close proximity (Mill Rd extension in particular). Hunua Quarry is also facing consenting pressures and reverse sensitivity issues as an expanding Auckland pushes up against its's boundary.

Currently all of Hunua quarry aggregate is utilised in the Auckland market – mostly for infrastructure projects (around 80%) with the balance roughly spread between residential and commercial operations.

Ensuring Hunua's continued operation, minimises both the economic costs of providing aggregate to Auckland and environmental costs associated with transporting rock. This assessment provides a high-level economic overview of the Hunua Quarry aggregate application and is structured in a way that addresses the eligibility criteria for projects under the Fast-track Approvals Bill. The project's regional or national significant is outlined, and the following sub-clauses of the Fast-track Approvals Bill are addressed:

• Clause 17(3):

(b) will deliver regionally or nationally significant infrastructure

(c) will increase the supply of housing, address housing needs, or contribute to a well-functioning urban environment (within the meaning of policy 1 of the National Policy Statement on Urban Development 2020)

- (d) will deliver significant economic benefits
- (e) will support primary industries, including aquaculture
- (f) will support development of natural resources, including minerals and petroleum

(g) will support climate change mitigation, including the reduction or removal of greenhouse gas emission:

(h) will support adaptation, resilience, and recovery from natural hazards

(i) will address significant environmental issues

Access to suitable, and sufficient high-quality aggregate, from appropriate locations is critical to delivering infrastructure and housing as well as facilitating economic activity across a range of industrial and productive



sectors. Aggregate is a high volume, low value commodity – transporting it from source to where it is used is expensive. Beyond the financial costs, environmental externalities arise from transporting aggregate, meaning travel distance must be minimised.

This economic analysis provides high level estimates of:

- the aggregate market and the demand-supply outlook,
- the potential benefits associated with enabling continued aggregate extraction at Hunua.

The results are described in terms of the eligibility criteria listed above.

1.2 Information sources

A number of sources were consulted as part of preparing this economic assessment, including:

- Information provided by Winstone Aggregates Limited
- Market Economics Limited in-house regional economic dataset
- Auckland Council information and data
- Central government guidance and datasets:
 - o Ministry of Transport
 - New Zealand Transport Agency
 - o Ministry for the Environment
 - o StatsNZ
- Industry sources and information releases.

1.3 Structure

The balance of this brief report is structured as follows:

- Section 2 describes the Aggregate market, supply and growth outlook.
- Section 3 outlines the Hunua Quarry application in terms of what it has the potential to deliver to the Auckland market.
- Section 4 outlines the regional and potential national benefits associated with the proposed expansion to the Hunua Quarry and how they align with the eligibility criteria.
- Section 5 presents key conclusions from this assessment



2 Aggregate market and outlook

Economic growth is in part related to urban development and expansion, meaning that the ability to cater for increases in population and economic outputs is heavily reliant on and directly linked to the sustained availability of aggregate. Sustaining GDP growth and economic performance aims, as well as catering for sustained household growth requires continued access to aggregate of appropriate quality and quantity, in an accessible location. Ensuring local sources of sustainably mined aggregate ensures it can be provided to market at a cost-effective price.

Aggregate supply has a central role in infrastructure delivery. Infrastructure investment in response to housing growth, high impact weather events, and new roading and other transport projects to meet economic growth requirements, need secure access to quality and appropriately located aggregate.

Aggregate supply in Auckland does not meet the city's total aggregate needs. Despite having some of New Zealand's largest quarries, aggregate is imported from Northland and Waikato. Aggregate is a high volume, low value commodity – importing it and transporting it add considerable cost to end users. According to the New Zealand Infrastructure Commission, *Te Waihanga* (2021), since 2014 there have been no new quarries established within Auckland; meanwhile only three expansions have been undertaken¹ - exacerbating shortages in the region. The report estimated Auckland's aggregate shortfall to be around 4.5m tonnes², which must be imported at a higher cost (both to purchasers and society).

The issues and constraints that aggregate users face are well understood, and research by the likes of the New Zealand Transport Agency (NZTA) confirms these challenges³. Adding to Auckland's aggregate supply faces numerous additional challenges, ranging from resource management policy to capital cost requirements. Other issues include:

- The lead time associated with developing new resource adds uncertainty in terms of reduces confidence to invest in capital equipment and to incur the necessary costs.
- The tight labour market and lack of workers with the requisite skills make finding new or replacement staff difficult.
- Utility grids are under strain and raising energy can be unfeasible in some scenarios.

These issues add complexity to production. Moreover, they make it harder to respond to changes in demand, entrenching the supply shortfall in Auckland.

This section starts with a summary of key demand parameters describing the aggregate market. These parameters are then applied to illustrate the demand outlook for Auckland. A short commentary about aggregate markets in Waikato and Northland is included. Next, the supply situation is summarised – the anticipated supply crunch is highlighted.

¹ <u>https://tewaihanga.govt.nz/our-work/research-insights/infrastructure-resources-study</u>

² This is higher than the M.E estimates that are described later in the report.

 $^{^{3}}$ An online survey of aggregate supply and demand by NZTA – conducted in 2020 and featuring 89 participants nationally, of whom 13 were from Auckland – sought to understand the views of key and representative groups within the industry. Nearly all Auckland respondents agreed that there were issues with aggregate supply, with more half than describing these as major issues.



2.1 Demand patterns – Nationally and Auckland region

Aggregate is used in construction as part of concrete applications, as well as for roading and drainage projects. It is also used across residential, community and business infrastructure development. Aggregate includes many product categories, with different sizes and grades influencing the final application and costs. Different products are used in multiple dimensions of the economy. One of the most obvious uses relates to transport infrastructure through base course, chip seal and in concrete applications (e.g., in bridges, culverts and barriers).

Official information about the volume of aggregate used, or extracted, is not available. However, there is a statistically significant relationship between population numbers and volumes of ready-mix concrete used. In addition to concrete production aggregate is also used;

- as a means of stabilising and reinforcement,
- in drainage applications,
- as base material under foundations,
- to protect pipes, fill voids and to provide hard surfaces.

It is estimated that 47.9 million tonnes of aggregate are produced in New Zealand (2022). The Infrastructure Commission's 2021 report derived an average per capita production of 8.4 tonnes. Using the 2022 population as reported by Stats NZ (5.1m), our estimates return a marginally higher per capita value of 9.3 tonnes – the different timeframes used is a possible reason for the difference, but the overall quantum is of a similar order of magnitude. Finally, the AQA of New Zealand estimates demand for aggregate in New Zealand to be between 7 and 10 tonnes per capita⁴.

At the regional level, it becomes clear that there are volumes of aggregate that are shipped between high production areas (Northland and Waikato) to high consumption areas (Auckland, Bay of Plenty) (Figure 2.1) as these key markets do not produce sufficient aggregate to meet all their needs.

⁴ AQA – <u>The Tyranny of Distance</u>





Figure 2.1: Regional Aggregate Demand and Production, 2023

2.1.1 The Auckland Market

A few large quarries in Auckland comprise most of the local supply, which amounts to 11 million tonnes in total. To supplement this supply, Auckland currently imports an estimated 4.5 tonnes of aggregate from Northland and Waikato.

2.1.2 Auckland Market Growth and Aggregate Shortfall

Projecting the 2023 demand and supply levels forward, we can show the size of the growing output gap in Auckland at five-year intervals until 2048. Due to the current limitations on the sector, we assume that supply does not increase over this period. Indeed, it is possible that supply would actually reduce as consents expire on existing sites. For future demand, we model two scenarios to illustrate possible pathways.

- Scenario 1: Based on anticipated population change and no change in per capita demand patterns.
- Scenario 2: Using high population growth and increasing per capita demand ratios to reflect potential requirements associated with climate change and related responses.

The demand outlook for aggregate shows steady increase under Scenario 1, increasing 24.9% over the next 25 years – equal to compound annual growth of 0.9%, or annual demand of 16.0 tonnes/annum. In contrast, under Scenario 2 the lift is significantly greater with demand more than doubling to 30.2 tonnes/annum by 2048. The percentage change is 116% and the compound growth rate is estimated at 3.1%.



Table 2-1: Demand outlook ('m tonnes)

	2023	2028	2033	2038	2043	2048
Medium Growth Scenario	12.8	13.4	14.1	14.8	15.4	16.0
High Growth Scenario	14.0	16.3	19.2	22.4	26.1	30.2

The output gaps reflect the wedge between demand and supply in Figure 2.2. In Auckland, population growth exacerbates existing sources – unless projects such as Hunua Quarry's expansion are consented.

Under the employment driven Scenario 1, Auckland's aggregate shortfall increases from 5.6m tonnes annually to almost 10m tonnes. Under a high growth Scenario 2, from 4.1m to close to 20m tonnes (as it includes increased consumption in response to changes such as climate change preparation).







3 Hunua Quarry Application

3.1 Current and future production

It is in this environment of aggregate shortfall and market demand growth that Hunua Quarry, operated by Winstone Aggregates is seeking an expansion of their quarry. Currently the Hunua Quarry produces around 3.0m tonnes of aggregate annually making up approximately 28% of Auckland's total aggregate production. Winstone Aggregates wish to do two things. First, expand the quarry from its current production level to approximately 5.4m tonnes annually over the course of 16 years. Second, they wish to secure production consent to continue extraction at the quarry for 9(2)(b)(ii)

Hunua Quarry is well placed relative to market demand within Auckland Region. It sits immediately adjacent to the Opaheke-Drury growth area that along with Drury South and West, is expected to add some 30,000 – 35,000 dwellings over 30 years. In addition, significant retail and employment developments including a large Metropolitan Centre, potentially a large medical facility along with associated roading infrastructure and public transport initiatives, mean that very local demand for aggregate will be high over the next 3 decades (at a minimum).

Figure 3.1: Auckland Region Future Development Strategy, November 2023



The additional production able to be extracted from the Hunua Quarry over the next **s** 9(2)(b)(ii) goes **a** long way to wards addressing Aucklands aggregate deficit (expected to increase from around 4m tonnes to

Assuming that the project is granted Fast Track status, Winstone Aggregates will be able to lift production above the 3.0m they are currently delivering to the Auckland market. The additional 2.4m tonnes over the lifetime of the quarry represents a significant contribution to Auckland's construction sector and the rock it displaces (from the Waikato Quarries) will not generate the significant volumes of Green House gas emissions needed currently to move it to Auckland.

The effects of these changes are significant and will be felt widely through the Auckland economy.

3.2 Fast Track consent criteria

As described above, in order for a project to be referred to the panel for consideration by the joint Ministers it must meet a range of criteria. These criteria include whether the project will benefit from the fast track process, in other words whether the fast track process allows the project to be delivered in a more timely and cost efficient way. In addition, whether the project would have significant regional or national benefits.

In making their decision, the Ministers may consider (among other things under section 17(3)) whether the project;

- Delivers significant regional or national infrastructure
- Increases the supply of housing or contribute to a well functioning urban environment
- Will deliver significant economic benefits
- Will support primary industries
- Will support the development of natural resources, including minerals
- Will support climate change mitigation, including the reduction or removal of greenhouse gas emissions

Outlined below are the ways in which this project either contributes towards all of the above criteria or generates the effects directly.



4 Regional and National Benefits

While Hunua Quarry operates in the Auckland economy, its scale and resulting market share, along with the projects ability to address issues across regional borders, means that **effects and benefits that flow from any expansion or extension to operating consents, are of national as well as regional significance**.

The average distance for aggregate travelling from Northland to the region border is 62 km; from the Waikato quarries it is 16 km, on average. This translates into 438 million km just to get the imported aggregate the regional border. Of course, this distance excludes the distance to delivered locations such as, concrete plants, and areas where construction activity is occurring – infill, redevelopment or greenfield developments. Using \$0.38 as the price per km tonne implies that **the additional transport costs to the border are \$166 million per year**. This suggests that if new quarries were established at the border, to replace the imported volumes, they would deliver a cost-saving to the Auckland economy.

Enabling Auckland quarries to expand would save these values, and realistically more, given the product is transport within the region and not only to the border. The urban centre approach illustrates the anticipated costs based on delivery to a more central location.

The environmental and social costs of getting aggregate to the Auckland border are also significant. The social costs of injuries and deaths are estimated as \$2.5 million, while the emissions costs are estimated at \$3.6 million, making the total costs \$172m. In Auckland it would also be appropriate to use urban emissions factors for part of the journey. If all the imported aggregate was delivered to Penrose – the location used to geotag Auckland City in the urban centre model – and applying the rural emissions factors, the total environmental cost would be \$8m. If we use the urban emissions factors for just the final 10% of that total travel distance, the environmental costs leap to \$26m. These are because of the significant health impacts resulting from pollutants being released in cities where population densities are high.

Many quarries in Auckland are constrained from expanding, increasing the importance of enabling those which can, to do so. Given its role as a hub of activity and business, ensuring sufficiency in the Auckland market is imperative.

Auckland's growth will require aggregate from increasingly far away, raising prices and hampering adjacent local markets, which themselves rely on a portion of their local aggregate supply. Much of Auckland's imported aggregate comes from Waikato, which is forecast to be the fastest growing region (by population %) over the next two decades. This will place additional pressure on sources of aggregate in the region which currently makes up Auckland's shortfall. It will also give rise to other pressures such as transport infrastructure and mixing aggregate transport with other road users.

Using a twenty-year appraisal period, the present value of savings (r = 5%) from establishing quarries on the Auckland border would be at least \$2.3bn. Several large quarries in Auckland and Waikato play a significant role in supporting infrastructure delivery in Auckland. Changing the imported share of aggregate will have widespread effects.

4.1.1 Infrastructure

As described above, aggregate is a foundation product. It sits at the core of the majority of building and development of factories, roads and other infrastructure. Therefore, while the project in and of itself does

not deliver regional or nationally significant infrastructure - without the additional production available as a result of this project, that infrastructure gets delivered at a higher cost.

Enabling aggregate to be extracted from Hunua to support the Auckland aggregate market will have direct benefits associated with the construction sector. The construction sector is regionally significant. It generates \$8.7bn of GDP, equal to 6.1% of the City's total GDP. Construction is also a significant employer, with 10% of Auckland employment falling in this sector. However, the true benefits that enabling Hunua quarry to expand extraction relates to the facilitated effects i.e., it would support construction, and underpin infrastructure delivery thereby enabling the economy to efficiently operate and efficiently grow. The immediate benefits of high quality infrastructure in the city-wide context are:

- Hard infrastructure requires concrete, and these investments include economic assets such as roads, bridges, ports, and railways. It is critically important to ensure that the infrastructure supports and improves the efficiency of moving goods, people, and information. If aggregate is not available, and infrastructure cannot be delivered in a cost-efficient or timely manner, then this will lead to cost/budget increases, travel delays and disruptions, long travel times and productivity losses for both individuals and businesses. Overall, these impacts reduce welfare standards.
- Infrastructure enables trade by reducing transaction costs between regions and countries. These connections stimulate and support growth.
- Well-developed infrastructure attracts domestic and foreign investment. The investment case is stronger for regions with reliable and robust transportation, communication, and energy network.
- Infrastructure investments in areas such as healthcare, education, and in the three waters contribute to improving the quality of life. This, in turn, enhances productivity, innovation, and economic competitiveness.
- Infrastructure investments can enhance resilience to natural disasters, climate change, and other shocks. For example, flood defences can reduce the economic costs associated with disruptions and damages. In addition, addressing damage after an event requires a strong supply chain, with an ability to access raw materials and processing capacity from diverse sources.
- Infrastructure projects often have long-term benefits that extend beyond immediate economic gains.

Aggregate is a direct input into Auckland's construction sector, enabling investment in projects delivering significant regional benefits. Catering for growth requires investment in infrastructure.

As indicated in the preceding section, the Auckland aggregate market demand more aggregate than what is produced locally. This deficit is projected to increase. Using the Kings Quarry resource offers a new opportunity to deliver aggregate from within Auckland. Using this resource offers an ability to supply aggregate to Auckland in a way that not only satisfies marked demand, but does so in a way that delivers a range of wider economic benefits.

The aggregate market, and its functioning in the context of construction and infrastructure delivery is regionally significant. Without sufficient aggregate, the market cannot operate efficiently, and



infrastructure delivery will be constrained with adverse flow on effects. However, aggregate is already imported from sources in Waikato and Northland. The transport function adds:

- Direct transport costs that flow through into construction costs,
- Externalities associated with
 - o Emissions costs
 - o Social costs

If these costs can be avoided, then society will be better off i.e., receive a benefit. These benefits/avoided costs can be quantified and expressed in monetary terms. Estimating the avoided costs requires an appropriate counterfactual.

Located on the western edge of the Hunua Ranges, adjacent to Papakura, north of Drury in South Auckland, Hunua Quarry will service Auckland's southern growth area. It is likely to act as substitute for aggregate that is imported from Waikato Region. It is assumed that aggregate from the Smythes quarry (east of Maramarua) will be displaced. There are other quarries in Waikato but given the scale of this resource and its favourable location relative to SH1, it is regarded as the principal alternative. The potential avoided distance is interpretated as the road distance between Smythes Quarry and the Drury interchange on SH 1 - 46km. Using the Smythes Quarry resource as alternative means that the estimated costs are the 'at least' cost. All other options face greater transport distances that will generate greater externalities.

The section starts by illustrating the link between infrastructure, growth, and concrete demand. This is performed by showcasing the types of projects that are underway or planned in Auckland and how these projects generate demand for aggregate. Next, the section summarises the avoided costs by firstly offering a short summary of the approach before presenting the results.

4.2 Auckland's significance to New Zealand

Auckland is New Zealand's largest city and is the economic centre. Most of New Zealand's economic and population growth will be centred in Auckland. Building and construction are key parts of Auckland's growth story. Crucially, the growth generates pressures and investment is needed in response to new pressures. However, the city is facing legacy issues that also require investment. Central government and Auckland Council are both undertaking significant investment to address old and new infrastructure issues. Infrastructure is built of aggregate – it is the key input into concrete used to address these issues.

Auckland is NZ's largest population centre and hosts 1.7m people – a third of NZ's total population. Over the past decade or so (2012 to 2022), Auckland's population grew by 15%. Looking ahead, the five-year period to 2028 will see another⁵ 4% increase. Over the longer term (2028-2048) the population is expected to increase by 20%. In contrast, the total New Zealand population is expected to increase by 14%. This outlook underlines Auckland significance in the New Zealand context. The city is a key destination for population growth and economic activity, and it will continue to act as NZ's premier population and investment destination.

⁵ This is based on the medium projections.



Over the past ten years, Auckland has experienced strong growth⁶, and GDP is estimated at \$133.7bn (in 2022). Overall, the City generates 38% of the national economic value. Over the last decade, Auckland's growth rate has surpassed that of New Zealand as a whole, with a 3.4% real terms annual increase, compared to the 3.0% national rate.

From 2001 to 2022, Auckland contributed to 41% of New Zealand's overall GDP growth. The growth translates into investment requirements associated with:

- Housing and residential areas
- Roads, and transport infrastructure (bridges etc)
- Three waters infrastructure
- Business locations
- Commercial and industrial buildings
- Social and civic amenities and buildings

In terms of GDP per employee (to reflect productivity), Auckland is outperforming the rest of NZ. This reflects the city's economic structure and composition. Auckland's GDP per employee is around 6% higher than the national average. Over the past decade (2012 and 2022), Auckland's GDP per capita grew broadly in line with the rest of the economy. Again, this underlines Auckland's role in the national economy, as well as a direct requirement to ensure that the infrastructure and investment activities support the city's growth. Infrastructure spending is critical, including investment in new assets together with ensuring that existing assets are maintained.

4.2.1 Infrastructure investment

New Zealand's infrastructure challenges are well-documented. Auckland is in a similar position and the 2023 flooding events highlighted infrastructure deficiencies, and caused widespread damage. Supporting population and economic growth will require ongoing investment to cater for that growth. At the same time, legacy issues must be addressed, and resilience must be built into the infrastructure landscape.

A NZTA report noted there has been a deficit in infrastructure re-investment for the medium term which, when coupled with strong population growth, means that much public infrastructure is coming to the end of its useful and/or economic life⁷. Combining the historic shortfalls with growth means that the demands on infrastructure investment are likely to become even more acute over the short-, to medium terms.

The investment pipeline shows the size of the infrastructure challenge. There are several large-scale infrastructure projects that will generate considerable demand for concrete, and therefore aggregate. The National Construction Pipeline report (MBIE) shows infrastructure construction activity in Auckland is forecast to grow consistently and by 12% to 2027 – this is despite the economic slowdown. The Infrastructure Commission's work lists several large projects that will generate significant demand for concrete, (aggregate). Examples of current, and funded (or funding sources confirmed) projects include:

• Kainga Ora projects:

⁶ Sourced from Infometrics.

⁷ https://www.nzta.govt.nz/assets/resources/research/reports/693/693-aggregate-supply-and-demand-in-new-zealand.pdf



- o Mt Roskill Precinct Project Bundles 1-3, stormwater and utilities,
- Mangere Precinct Projects and rail station upgrades.
- Tamaki Precinct Projects Bundles 1 and 2, and stormwater and water supply projects.
- Watercare
 - o Central Interceptor,
 - o Queen Street wastewater diversion and piping,
- Ministry of Education
 - 24 projects ranging from new schools, to expanding facilities in response to roll growth.
- Auckland Transport
 - Several projects, including the Carrington Road projects.
- Eke Panuku projects
 - o Including Osterley and Amersham Way Streetscape works.

These projects' budgets sum to \$1.8bn and are occuring over the next 4-5 years. Projects beyond this time horizon are not funded (so not included in this list). Other high-profile projects that are in the pipeline include:

- Auckland Airport: The airport is a crucial component of New Zealand's domestic and international economy. The investment in the airport and associated facilities is a \$3.9bn programme over the next 6 years. Some of the announced projects were put on hold due to the uncertainty introduced by Covid-19, but these are now starting up again.
- Second harbour crossing and North Shore Light Rail: While the new Coalition Government has cancelled immediate plans for a new harbour crossing, there is a real need and they are likely to investigate an alternative. This will involve significant investment for North Shore public transport (be it rail or bus based) as well as a second harbour crossing over or under Waitematā Harbour (up to \$15bn). Timing is uncertain however, it will most likely be required to begin within the decade. While the future of light rail is uncertain, ongoing investment in transport infrastructure will be needed.
- **Penlink corridor**: this project is underway and is a 7km transport connection between the Whangaparāoa Peninsula and SH1 at Redvale, which will include new local road connections and a bridge crossing the Wēiti River. These works are estimated to be completed in late 2026 and will cost around \$830m.

In addition to the very large items listed above, NZTA, Auckland Transport and various other public bodies and agencies have numerous ongoing and planned projects to improve the region. Taken together, their cumulative demand is a large part of total demand.

The Central Rail Link is a large project that will transform Auckland's urban form. Using basic facts about this project highlight the critical nature of aggregate in supporting infrastructure investment.

Example project: Central Rail Link

Over the course of the project, more than 20,000 truckloads of concrete have been delivered to site, nearly 100,000m³ of concrete has been poured and over a dozen concrete mixes have been used – including some unique mix designs. On average, more than 880m³ of concrete is delivered to site every week. The aggregate component associated with this volume of concrete is 108,000 tonnes and 132,000 tonnes. This translates to between 3,600 and 4,400, 30 tonne truck loads of aggregate.

Infrastructure spending is often designed with a specific purpose of supporting economic productivity and subject to extensive cost-benefit analysis. These evaluation process consider all costs and all benefits – direct, indirect and consequential. Infrastructure is built of aggregate. It is therefore essential to have enough natural resource, to support any infrastructure delivery programme sourced at the least cost to the economy and the environment.

4.3 Economic Impacts of Hunua Quarry Expansion

The vast majority of the economic benefits that flow from the expansion of the Hunua Quarry arise from the economic effects that the infrastructure, housing and industrial buildings made using aggregate provide. However, there are other sources of economic benefits for the region, including;

- Construction and operational effects of the quarry itself
- Avoided transportation costs

These are outlined below

4.3.1 Economic impacts of constructing and operating an expanded quarry

The expansion of the Hunua Quarry to enable Winstone Aggregates to extract additional rock, requires a significant investment in the Auckland Economy. Over the lifetime s 9(2)(b)(ii) Winstone's expect to invest more that s 9(2)(b)(ii) to establish and operate the extended quarry. In total the plans will yield more than s 9(2)(b)(ii).

While this spend is spread over time, **s** 9(2)(b)(ii) will be spent in the next 10 years. In total the spend contributes directly to GDP almost s 9(2)(b)(ii), and supports the employment equivalent $to^{s} 9(2)(b)(ii)$ workers working full time for a year. Note that these have also been discounted at 2% over the duration of the project. A lower value has been selected to reflect the long term dividends that the quarry delivers to the economy that would be unfairly hampered by a high discount rate.

In present value terms (NPV $_{2\%}$) the direct contribution to GDP is s 9(2)(b)(ii)



	Quarry Lifetime - Nominal		NPV - 2%
Direct			
Output (\$m)	\$	s 9(2)(b))(11)
Contribution to GDP (\$m)	\$		
Employment			
Total Effects			
Output (\$m)	\$		
Contribution to GDP (\$m)	\$		
Employment			

Figure 2: Construction effects of expanding Hunua Quarry, 2025 - 2097

In order for the quarry to expand, it must carry out significant amount of works and purchase plant and machinery to extract and process the rock. They also pay their staff salaries and wages who spend in Auckland. This increase in demand (from the quarry and workers) is spread across other sectors of the economy who will increase their output to match the increased demands. In turn they source raw materials and services from their suppliers, pay wages and salaries and so on.

The sum of those transactions is captured in Figure 4 as the total effects. An injection of almost s g(2)(b)(ii) in direct terms generates total output in the economy over s g(2)(b)(ii). OF this some g(2)(b)(ii) is as contribution to regional GDP. This level of activity sustains employment equivalent to g(2)(b)(ii) full time work years.

In net present value terms (NPV_{2%}) the contribution to GDP is valued at 9(2)(b)(i) This is a significant benefit to the Auckland economy that would not occur other than through the granting of a Fast Track consent.

4.3.2 Avoided costs are also benefits

It is in this environment of aggregate shortfall and market demand growth that Hunua Quarry, operated by Winstone Aggregates is seeking an expansion of their quarry. Currently the Hunua Quarry produces around 3.0m tonnes of aggregate annually making up approximately a quarter of Auckland's total aggregate production. Winstone Aggregates are seeking Fast Track consent to extend the quarry both physically and through time. The effects of these changes are significant and will be felt widely through the Auckland economy, especially the southern areas.

Transporting aggregate is expensive, with costs directly linked to distance. Industry information indicates that to move a tonne of aggregate 1km along the road network costs close around \$0.38. In addition to the direct costs are the productivity gains associated with shorter transportation distances. If sourcing aggregate from distance requires a 30 tonne truck to travel an hour to market and a locally sourced aggregate truck takes 30 minutes, then productivity lifts when sourcing from local providers.

Clearly, any unnecessary travel distance will have an adverse effect on total costs. For example, the estimated transport cost of delivering aggregate to Drury from Smythes Quarry is around \$18/tonne. This is the cost to transport the aggregate into the Auckland market, but it could be even greater if deadheading



occurs⁸. Deadheading increases the cost to the cartage provider and these costs are often included in the delivered price (of aggregate).

To place that into perspective, each new dwelling on average requires around 250 tonnes of aggregate. The residential growth around Drury is anticipated to yield around 25,000 new dwellings. This translates to 6.25m tonnes of aggregate **or around \$92.5m in additional transport costs alone**, to source it from outside Auckland. In addition, are costs associated with transporting aggregate for new roading and other infrastructure required to develop the Drury Opaheke growth area. Note that for each 1km of 2 lane roading 14,000 tonnes of aggregate (or around 500 truck and trailer loads)⁹ are required.

These are additional economic costs that are avoidable through facilitating quarries such as Winstone Aggregates Hunua Quarry to expand and extend their consented lifespan.

On top of the direct transport costs that flow through to end users, other costs can be distinguished, including:

- Emission costs
- Social costs
- Other costs.

These costs are calculated using the distances of Hunua Quarry and an alternative quarry outside of the Auckland region to key points of demand in the Auckland region. The Smythes quarry in the Waikato region was chosen as the alternative quarry used for the comparison. This site represents the closest southern point from which aggregate would be sourced to meet Auckland's output gap. The site is representative of the distances required to transport aggregate, which is imported form the Waikato region, although other quarries further from Auckland may also be used to meet demand. Two destination points of Penrose and Drury are used to reflect the distances associated with sub-markets in the southern part of the Auckland region. These were chosen as relevant points for the Hunua quarry as Penrose is the main industrial centre of Auckland and Drury is a high growth area within close proximity to the Hunua site. The distances used in the modelling are shown in Table 4.1.

Quarry	Rural Distance (km)	Urban Distance (km)	Total Distance (km)			
Penrose						
Winstones Hunua	2.3	26.7	29			
Smythes	46.2	25.8	72			
Additional from Smythes	43.9	-0.9	43			
Drury						
Winstones Hunua	2.3	7.7	10			
Smythes	46.2	0	46.2			
Additional from Smythes	43.9	-7.7	36.2			

Table 4.1: Transport Distance from Quarry

⁸ A deadhead in trucking refers to the practice of driving a commercial truck, typically a semi-truck, with an attached trailer but no freight being carried. It occurs when a trucker returns to the point of origin or backhauls an empty cargo container.

⁹ Aggregate and Quarry Association of New Zealand, Fact-Files, 2021, <u>https://aqa.org.nz/fact-files/</u>


The potential cost savings of enabling Hunua Quarry's growth and change are summarised below.

4.3.3 Direct transport cost savings

The distance aggregate is transported has a direct bearing on the delivered price. Substituting Waikato aggregate, specifically Smythes Quarry, with Hunua Quarry rock facilitated by this Fast Track Application, to meet demand in southern parts of Auckland will reduce the direct transport costs by an estimated \$27.5m per million tonnes when delivered to Drury and \$32.7m per million tonnes when delivered to Penrose. This represents a significant portion of the total value of the delivered aggregate that will be avoided if Fast Track consent is granted¹⁰.

On a per tonne basis, the extra transport cost is substantial and avoid it will have downward pressure on aggregate prices, helping to reduce construction costs across all activities that need aggregate, ranging from roads and bridges, to residential construction and amenities.

Assuming that at least 1.8m tonnes additional rock is available under the proposed expansion, then sourcing the rock from Hunua will save almost \$50m if delivered to Drury and almost \$59m if to Penrose, annually. However, the true figure will be higher as the proposal is to extend the existing output as well. IN that case all 5.4m tonnes can be seen as additional (in future years). At this volume the savings from Hunua on transport costs alone are between \$148.5m to Drury and \$176.6m to Penrose – annually.

Clearly, enabling Hunua Quarry to extend and expand will generate direct transport cost savings relative to the principal alternative. These saving arise because the need to transport aggregate is reduced. Other benefits that arise from enabling a lower-cost provider include:

- Lower aggregate prices that will reduce, or at least suppress, the concrete price component of infrastructure project budgets.
- Extra competition ensures that the market remains efficient.
- End users have wider choice in terms of aggregate supply options because expanded supply in Auckland's south can compete for customers in central and southern Auckland, potentially containing prices for delivered aggregate in these areas. This supports competition and helps to keep prices low.

4.3.4 Environmental Costs

The Hunua operation would enable significant emission savings. Delivering the aggregate from Hunua to central and south Auckland's aggregate users generates considerably more emissions than from aggregate outside of the Auckland region. Table 4.2 shows the cost factors used to calculate the emissions levels and costs of aggregate transportation. These factors and the associated methodology are sourced from New Zealand Transport Agency's Vehicle Emissions Prediction Model (VEPM v6.3) and the Monetised Benefits and Costs Manual¹¹

 $^{^{\}rm 10}$ Between 50% - 60% of the delivered price.

¹¹ Version 1.6.1, June 2023 and <u>Monetised benefits and costs manual</u>



Table 4.2: Emissions Cost Factors (source: VEPM v6.3)

	Emission costs and factors				
	СО	NOx	PM2.5	VOC	СО2-е
Cost/tonne (Rural)	\$0.23	\$28,843	\$58,880	\$73	\$94
Cost/tonne (Urban)	\$5.84	\$1,038,788	\$1,024,422	\$47,193	\$94
Emissions factors 2023 (g/tonne) Diesel Articulated	1.36-1.37	4.58-4.67	0.17-0.18	0.13	675.78- 720.13

The emissions factors are applied to the transport distances to estimate the level of emissions per million tonnes of aggregate. The emissions levels are shown in Table 4.3. When applied to the additional distance required to move aggregate into Auckland, the level of pollutants is higher when aggregate is imported to Penrose and Drury from the Waikato region. This estimate includes the emissions associated with truck movements between the quarry sites and the sub-market reference points. It does not include any flow-on emission arising from congestion on the road network due to extra trucks.

Table 4.3: Emissions per million tonnes of Aggregate

	со	Nox	PM2.5 Exhaust	voc	CO2-e	
	Delivering to Drury					
Winstones Hunua	1.	1 :	3.4 0.1	0.1	590	
Smythes	5.	3 1	5.7 0 .6	0.4	2,724	
Additional from Smythes	4.	1 1:	2.3 0.5	0.3	2,134	
Delivering to Penrose						
Winstones Hunua	3.	3 !	9.8 0.4	0.3	1,710	
Smythes	8.	2 24	4.4 0.9	0.6	4,245	
Additional from Smythes	4.	9 14	4.6 0.5	0.4	2,535	

Table 4.4 shows the emissions translated into monetary values using cost factors. These cost factors differ between urban and rural settings, because emissions are valued differently for urban and rural. This assessment considers the distance proportions as shown in Table 4.1. Costs in urban areas are significantly higher. Depending on the pollutant, the urban costs are between 17 and 644 times higher than the rural ones, due to population densities experiencing the pollution.

Table 4.4: Cost of Emissions per million tonnes of Aggregate

Quarry	со	Nox	PM2.5 Exhaust	VOC	CO2-e	Total
		Delivering	g to Drury			
Winstones Hunua	\$5	\$2,739,000	\$100,000	\$3,000	\$55,000	\$2,897,000
Smythes	\$7	\$3,621,000	\$145,000	\$4,000	\$255,000	\$4,026,000
Additional from Smythes	\$2	\$882,000	\$45,000	\$1,000	\$200,000	\$1,129,000
Delivering to Penrose						
Winstones Hunua	\$18	\$9,441,000	\$342,000	\$11,000	\$160,000	\$9,954,000
Smythes	\$18	\$9,553,000	\$363,000	\$11,000	\$398,000	\$10,325,000
Additional from Smythes	\$1	\$112,000	\$21,000	\$0	\$238,000	\$371,000

As the transportation of aggregate from the Hunua quarry will produce lower levels of emissions than the aggregate imported from the Waikato region, the total costs associated with are lower even with a higher amount of urban transport and the high costs associated with Nox and VOC emissions within urban contexts. Based on estimated distance, the associated emissions and the value of emissions, the total potential annual environmental savings is an estimated at \$1.13m per million tonnes delivered to Drury and \$0.37m per million tonnes delivered to Penrose.

These estimates should be viewed carefully as the calculations are highly sensitive to changes in proportions of each journey between urban and rural. This is determined by Auckland's existing boundaries of urban activity, however, as highlighted in previous sections, Drury and the current rural area south of Auckland is projected to experience significant growth in the near future. This growth is likely to extend the urban boundaries of Auckland, increasing the distance Waikato aggregate would travel through urban environments and subsequently increasing the emissions costs. As such the additional costs is likely to grow in the future.

4.3.5 Social Costs

Additional to the direct transport and environmental costs are the social costs associated with injuries and deaths. For every extra truck kilometre travelled, there is an increase in the likelihood of injuries, serious injuries, and deaths from road accidents. The cost factors used to calculate the social costs of the aggregate transport are shown in Table 4.5.

Table 4.5: Social Cost Factors

	Death	Serious injury	Minor Injury
Social cost (\$ per instance @2023 prices)	\$14.2m	\$0.7m	\$0.08m
Deaths/Injuries per 100 million km (risk factor)	2.5	4.3	17.5

Using official valuation approaches, the risks associated with travel distances are translated into social costs, specifically deaths, serious injury and minor injuries. Applying the Ministry of Transport's metrics suggests that avoiding the additional transport function would generate savings. Considering that the Value of a Statistical Life (VoSL) is estimated at \$14.2m, a serious injury is valued at around \$739,200 and minor injury is \$78,200, then there is value in removing/mitigating the risk of injuries.

The cost estimates total between \$1.0m and \$1.2m per million tonnes if the Hunua aggregate is replaced by aggregate imported from the Waikato region that result in higher transportation distances as modelled. As with the environmental costs, these are likely to rise as the Value of Statistical Life increases overtime.

Therefore, by avoiding those costs, the Hunua Quarry represents a benefit to the Auckland economy of the same value.



4.4 Total Benefits

The benefits associated with enabling Hunua Quarry to extent it's lifespan and to increase its volume of aggregate extraction to s 9(2)(b)(ii) will be felt over the next s 9(2)(b)(ii). The annual values can be expressed in present value terms by discounting future values. The discounting process reduces the relative importance of future benefits (or costs) relative to short term benefits.

Two scenarios are presented – the first accounts for the amount of rock able to be extracted from Hunua over and above existing consents. It assumes that the existing consents expire in 2034, 2046 and 2056. The second assumes that the existing consent continues and it is simply the additional rock **s** 9(2)(b)(ii) current production) that generates benefits.

Using a default discount rate of 5%, over the $\frac{9(2)(b)(ii)}{ii}$ period suggests that the present value of the benefits Under Scenario 1 range between $\frac{9(2)(b)(ii)}{ii}$ for the Auckland economy, if the rock is delivered to Drury and $\frac{9(2)(b)(ii)}{ii}$ if delivered to Penrose (Figure 3). The majority of this relates to avoided transport costs.

Figure 3: Present Value of Total Benefits (\$m NPV_{5%}) – Scenario 1 – existing consents expire.

	Penrose	Drury
Direct Transport Benefits	s 9(2)(b)(ii)	s 9(2)(b)(ii)
Environmental Benefits	s 9(2)(b)(ii)	s 9(2)(b)(ii)
Social Benefits	s 9(2)(b)(ii)	\$62.2
Total Benefits	s 9(2)(b)(ii)	s 9(2)(b)(ii)

Under Scenario 2, that assumes the existing consents are renewed at their current level over time and the additional rock is simply the difference between current production and the new higher limit of 5.4 m tonnes generates a net present value of between $\frac{s}{2}(2)(b)(ii)$ and $\frac{s}{2}(2)(b)(ii)}$ over the quarry's life.

Figure 4: Present Value of Total Benefits (\$m, NPV_{5%}) – Scenario 2 – existing consents endure.

	Penrose	Drury
Direct Transport Benefits	s 9(2)(b)(ii)	s 9(2)(b)(ii)
Environmental Benefits	s 9(2)(b)(ii)	s 9(2)(b)(ii)
Social Benefits	s 9(2)(b)(ii)	s 9(2)(b)(ii)
Total Benefits	s 9(2)(b)(ii)	s 9(2)(b)(ii)

Based on the above transport, environmental and social costs that would be avoided by enabling Hunua Quarry's expansion and extension under a Fast Track Consent. I conclude that the regional benefits are significant.

Given the importance of the Auckland economy to the national economy and the scale of potential benefits, these effects are significant at a national level as well.



5 Conclusions

Efficient and sustainable access to Aggregate is an important factor in facilitating Auckland's economic growth aspirations and providing infrastructure such as roading, buildings, and other infrastructure to support Auckland's rapidly growing population and economy.

Winstone Aggregates Fast Track Consents will facilitate significant high-quality aggregate for the Auckland market at sustainable prices. The volume enabled by the consent translates into cement used across Auckland in house construction, infrastructure, high rise buildings and factories and warehouses. The local presence of aggregate and the ability to utilise it sustainably contributes significantly to the economic wellbeing of Aucklanders.

The cost of a single truck load of aggregate doubles around every 30km it is carted due to its high mass and relatively low value nature. Major alternative sand suppliers to Hunua include Smythes Quarry in Waikato Region, a distance of more than 46km further away from the key demand markets.

While savings in transport, environmental and social costs represent the key economic benefits of allowing Winstone Aggregates to extend and expand extraction under a Fast Track consenting regime, the real benefits arise from a more efficient and cost-effective Auckland economy helping to drive New Zealands growth.

Table 5-1 provides commentary illustrating how Hunua Quarry's Fast Track Consent application aligns with the eligibility criteria as outlined in Clause 17(3) of the Fast Track Application Bill. The presence of the aggregate close to where it is needed, and the ability to access it sustainably contributes significantly to the economic wellbeing of Aucklanders.

 (b) will deliver regionally or nationally significant infrastructure Auckland generates 38% of New Zealand's GDP, and without sufficient, aggregate, the city' economic performance will suffer, and in turn this will have adverse effects on New Zealand's economy. Aggregate is an essential ingredient of concrete, and concrete is needed across the entire urban landscape. Aggregate is also used in raw format across a range of other non concrete uses. Hunua Quarry aggregate offers an opportunity to avoid the adverse effects of a local shortfall in aggregate by substituting imported rock for locally quarried aggregate. This will support the local market and place downward pressures on aggregate, and reduce the transport load. (d) will deliver significant economic benefits Supplying the Auckland market using the Hunua Quarry resource, instead of importing it from Northland will avoid considerable costs. The avoided costs are seen as benefits and the analysis shows that the present value of these avoided costs sit between \$1,8bn and \$2.3bn assuming existing consents expire – avoiding these costs translates into a significant economic benefit. 	Eligibility criteria Clause 17(3):	Comment
 (d) will deliver significant economic benefits Supplying the Auckland market using the Hunua Quarry resource, instead of importing it from Northland will avoid considerable costs. The avoided costs are seen as benefits and the analysis shows that the present value of these avoided costs sit between \$1,8bn and \$2.3bn assuming existing consents expire – avoiding these costs translates into a significant economic benefit. (f) will support Auckland's aggregate market is in deficit with large shares of total demand satisfied using 	(b) will deliver regionally or nationally significant infrastructure	Auckland generates 38% of New Zealand's GDP, and without sufficient, aggregate, the city's economic performance will suffer, and in turn this will have adverse effects on New Zealand's economy. Aggregate is an essential ingredient of concrete, and concrete is needed across the entire urban landscape. Aggregate is also used in raw format across a range of other non-concrete uses. Hunua Quarry aggregate offers an opportunity to avoid the adverse effects of a local shortfall in aggregate by substituting imported rock for locally quarried aggregate. This will support the local market and place downward pressures on aggregate, and reduce the transport load.
(f) will support Auckland's aggregate market is in deficit with large shares of total demand satisfied using	(d) will deliver significant economic benefits	Supplying the Auckland market using the Hunua Quarry resource, instead of importing it from Northland will avoid considerable costs. The avoided costs are seen as benefits and the analysis shows that the present value of these avoided costs sit between \$1,8bn and \$2.3bn assuming existing consents expire – avoiding these costs translates into a significant economic benefit.
development of natural imported aggregate. Developing the Hunua Quarry resource/mineral is consistent with developing resources in a responsible and efficient way.	(f) will support development of natural	Auckland's aggregate market is in deficit, with large shares of total demand satisfied using imported aggregate. Developing the Hunua Quarry resource/mineral is consistent with developing resources in a responsible and efficient way.

Table 5-1: Alignment with Fasttrack legislation criteria

resources, including minerals and petroleum	
(g) will support climate change mitigation, including the reduction or removal of greenhouse gas emission	Minimising the distance that aggregate, and concrete, travels to end users ensures that the associated emissions are kept to a minimum. The analysis illustrates large effects of transporting aggregate on emissions. This proposed project will have an immediate, and direct impact on reducing emissions. The project will deliver a step-down in emissions and given the long project lifecycle will ensure that locally generate emissions is minimised.
(h) will support adaptation, resilience, and recovery from natural hazards	Apart from ensuring that there is enough aggregate to support Auckland's growth, enabling the project will enhance the market's resilience because key supply sources will be within the region, and not subject to infrastructure (road) failures to the north of Auckland.
	In a post-disaster situation, reinstating infrastructure as fast as possible is crucial. It is plausible that the natural event that caused widespread damage could also damage transport infrastructure. Developing and maintaining multiple sources for aggregate is prudent.



Appendix C: Environmental credentials

Winstones is an industry leader and takes its environmental footprint very seriously, it is committed to long-term sustainability. As part of the Winstone sustainability strategy an Environmental Product Declaration (EPD) for aggregate and sand products was undertaken, making Winstone the first quarry company in New Zealand to do so. Released in February 2022, the EPD covers the embodied carbon of products from eight quarries across the country.

To further demonstrate commitment to sustainability Winstones developed a positive biodiversity plan with the goal of achieving positive biodiversity by 2030. This plan involves implementing voluntary pest control measures across their sites, focusing on degraded native vegetation within ecological districts without existing pest control programs. Winstone plans to invest \$3.2 million by 2030, with an initial investment of \$600,000 in the first year alone.

Winstones efforts in sustainability and biodiversity have been recognised by industry peers. They were awarded the 2022 MIMICO Environment and Community Award for being the first quarry company in New Zealand to produce an EPD for aggregate and sand products. This prestigious award was determined by popular vote at the QuarryNZ conference.

In addition to biodiversity and sustainability initiatives, Winstones conducted a Life Cycle Assessment (LCA) of their products in 2020. Working with environmental services consultancy thinkStep, an assessment of the environmental impacts of their product inputs and outputs, including electricity, diesel, water, waste, and emissions was undertaken. The outcome of the LCA was the EPD, a science-based and independently verified document that communicates transparent and comparable data about the lifecycle environmental impacts of their products.

The EPD not only addresses carbon emissions but also considers the environmental impacts of acid rain, algal blooms, summer smog, energy use, and water consumption. It covers all stages of the product life cycle and adheres to international standards. Winstones EPD supports end users in their commitment to environmental sustainability

Confidential and Commercially Sensitive:

Contains information that would unreasonably prejudice the commercial position of Winstone Aggregates if released Page 39



and seeking credits with relevant rating schemes such as the Infrastructure Sustainability Rating Scheme and Green Star Design and As Built New Zealand v1.0.

Through Winstones sustainability efforts, including biodiversity initiatives and the production of the EPD, the aim is to reduce Winstones environmental footprint and become national leaders in the aggregate industry. Winstone prioritises transparency, environmental protection, and continuous improvement as key pillars of the sustainability strategy.

Confidential and Commercially Sensitive: Contains information that would unreasonably prejudice the commercial position of Winstone Aggregates if released

Page 40



Tiritiri Matangi Gecko Reintegration Project Summary

As part of the ongoing development of the Symonds Hill pit at Hunua Quarry, a comprehensive gecko relocation programme has been implemented. This initiative is a proactive response to the habitat disturbance necessitated by quarrying activities, ensuring the protection and preservation of the local green gecko population, which is an integral component of the region's natural heritage.

The Tiritiri Matangi Gecko Reintegration Project has seen significant success, particularly in 2019, with a record birth rate. In December 2019, 20 geckos were introduced into a purpose-built soft-release site on the island, followed by the release of 19 baby geckos bred from previously salvaged individuals. The project achieved another milestone on 16 May 2020 when 48 geckos, including 13 gravid females, were released into the soft-release site in anticipation of lockdowns due to COVID-19. This timely release allowed the females to acclimatise and give birth, contributing to many sightings throughout 2022 and 2023.

The breeding facilities on Tiritiri Matangi are maintained for ongoing and future conservation efforts, including the possibility of receiving more geckos from the Hunua Quarry project. These facilities are designed to ensure optimal health and breeding conditions for the geckos.

The soft release site, utilised pre-COVID, spans a 0.5 ha area with quality scrub habitat, enclosed by a low cloth fence to temporarily confine the geckos. After a year, the fence was removed, allowing the geckos to disperse naturally. Notably, many have remained near the release area. Future releases, including those from Hunua Quarry, will occur in this area, with geckos initially housed in a captive breeding facility to promote a robust wild population.

Monitoring is conducted through photographic ID, using the geckos' unique pattern markings for identification without the need for capture. This method confirms survival and breeding without harming the animals.

Confidential and Commercially Sensitive: Contains information that would unreasonably prejudice the commercial position of Winstone Aggregates if released



Historic accounts, including lighthouse keeper diaries from the 1800s and early 1900s, indicate the presence of Kakariki Green Geckos on the island, which are believed to have been eradicated due to farming activities and predation by rats. The island is now pest-free and mostly reforested, providing an ideal habitat for gecko reintroduction.

Confidential and Commercially Sensitive: Contains information that would unreasonably prejudice the commercial position of Winstone Aggregates if released

Page 42

winstoneaggregates.co.nz



Appendix D: Engineering drawings

Confidential and Commercially Sensitive: Contains information that would unreasonably prejudice the commercial position of Winstone Aggregates if released Page 43

winstoneaggregates.co.nz